

Claims

- [c1] 1. An electroplating apparatus, for electroplating a workpiece having a plating area and at least an electrical contact point at a rim thereof, comprising:
- a bath equipped with a workpiece interface under which the workpiece is placed;
 - a meshed anode electrode placed within the bath;
 - a cathode electrode placed at a rim of the workpiece interface and electrically connected to the electrical contact point of the workpiece; and
 - a flow-distribution device placed between the meshed anode electrode and the workpiece, wherein the flow-distribution device comprises a plurality of flow-distributing holes for providing an uniform distribution of a plating solution with even flow pressure over the workpiece.
- [c2] 2. The electroplating apparatus of claim 1, wherein the flow-distribution device is comprised of an insulating material.
- [c3] 3. The electroplating apparatus of claim 1, wherein the flow-distributing holes are uniformly distributed on the flow-distribution device.

- [c4] 4. The electroplating apparatus of claim 1, wherein a shape of the flow-distributing holes is conical.
- [c5] 5. The electroplating apparatus of claim 1, wherein a shape of the flow-distributing holes is cyclindrical H-shape.
- [c6] 6. The electroplating apparatus of claim 1, wherein the bath comprises an inlet and at least an outlet, wherein a plating solution flows from the inlet, and the plating solution then flows through the meshed anode electrode and the flow-distribution device to provide a turbulent current uniformly distributed over the workpiece, and then flows out of the bath via the outlet, and wherein the plating solution within the bath is refreshed accordingly.
- [c7] 7. The electroplating apparatus of claim 1, wherein a distance between the flow-distribution device and the workpiece is in a range of 0.1 millimeter (mm) to 500.0 mm.
- [c8] 8. An electroplating apparatus, for electroplating a workpiece having a plating area and at least an electrical contact point at a rim thereof, comprising:
a bath, comprising an outer bath equipped with a workpiece interface where the workpiece is placed and an inner bath placed within the outer bath, equipped with a

flow-distribution device interface;
a meshed anode electrode placed inside the inner bath;
a cathode electrode placed at a rim of the workpiece interface and electrically connected to the electrical contact point of the workpiece; and
a flow-distribution device placed at the flow-distribution device interface of the inner bath between the meshed anode electrode and the workpiece, wherein the flow-distribution device comprises a plurality of flow-distributing holes for providing an uniformly distributed flow of the plating solution over the plating area of the workpiece.

[c9] 9. The electroplating apparatus of claim 8, wherein the flow-distribution device is made of an insulating material.

[c10] 10. The electroplating apparatus of claim 8, wherein the flow-distributing holes are uniformly distributed on the flow-distribution device.

[c11] 11. The electroplating apparatus of claim 8, wherein a shape of the flow-distributing holes is conical.

[c12] 12. The electroplating apparatus of claim 8, wherein a shape of the flow-distributing holes is cylindrical H-shape.

- [c13] 13. The electroplating apparatus of claim 8, wherein the outer bath is equipped with an outlet and the inner bath is equipped with an inlet, wherein a plating solution flows from the inlet and then the plating solution flows through the meshed anode electrode and the flow-distribution device to form a turbulent current and uniformly distribute the plating solution over the plating area of the workpiece, and then flows out of the bath via the outlet, and wherein the plating solution is refreshed accordingly.
- [c14] 14. The electroplating apparatus of claim 8, wherein a distance between the flow-distribution device and the workpiece is in a range of 0.1 millimeter (mm) to 500.0 mm.
- [c15] 15. The electroplating apparatus of claim 8, wherein the inner bath is a funnel-shaped bath having a first opening and a bigger second opening, wherein the inlet is installed at the first opening, and the flow-distribution device is installed at the second opening.
- [c16] 16. An electroplating apparatus, for electroplating a workpiece having a plating area and at least an electrical contact point at a rim of the thereof, comprising:
an outer bath equipped with a workpiece interface where

the workpiece is placed;
an inner bath placed coaxially inside the outer bath,
wherein and the inner bath is equipped with a flow-
distribution device interface at a first opening of the in-
ner bath for directing a plating solution towards the
workpiece interface, the flow-distribution device com-
prising a plurality of flow-distributing holes for provid-
ing an uniformly distributed plating solution with even
flow pressure over the plating area of the workpiece;
a meshed anode electrode placed inside the inner bath;
a cathode electrode placed at a rim of the workpiece in-
terface of the outer bath and electrically connected to
the electrical contact point of the workpiece; and
a plating solution supply device that is connected to a
second opening of the inner bath, for pumping a plating
solution to the inner bath via the second open-
ing, wherein the plating solution flows through the
meshed anode electrode and the flow-distribution device
and then flows out of the outer bath via a outlet, and
wherein the plating solution is refreshed accordingly.

[c17] 17. The electroplating apparatus of claim 16, wherein
the flow-distribution device is made of an insulating ma-
terial.

[c18] 18. The electroplating apparatus of claim 16, wherein a
shape of the flow-distributing holes is conical.

- [c19] 19. The electroplating apparatus of claim 16, wherein a shape of the flow-distributing holes is cylindrical H-shape.
- [c20] 20. The electroplating apparatus of claim 16, wherein a distance between the flow-distribution device and the workpiece is in a range of 0.1 mm to 500.0 mm.